BARTON'S (Radio) LIMITED

42, TOTTENHAM COURT ROAD

LONDON, W.1

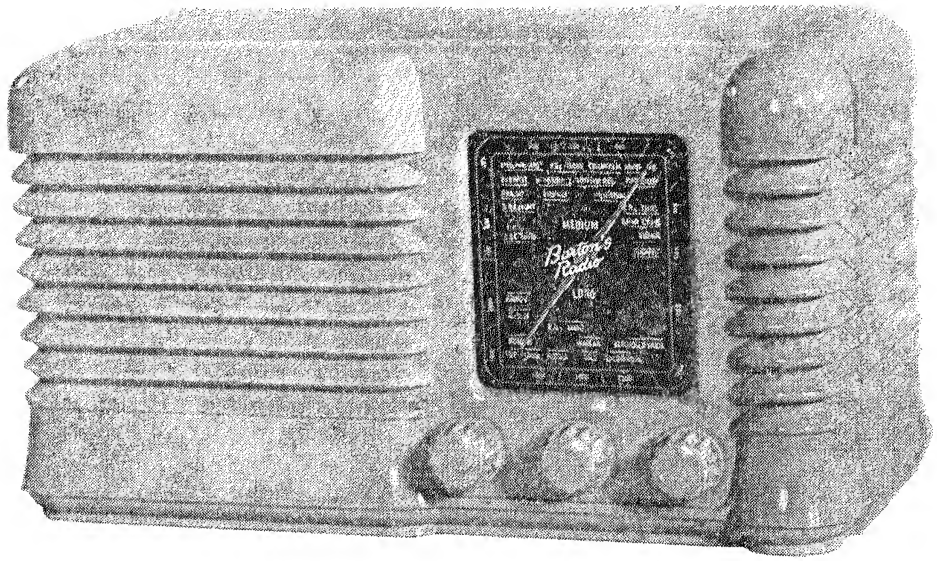
Telephone : LANgham 1151/2

THE RADIO YOU *CAN BUILD*

BARTON'S

A.C. SUPERHET

RADIO RECEIVER



INSTRUCTION BOOKLET 1/-

ALL COMPONENTS SUPPLIED BY US GUARANTEED ONE YEAR

SUPERHET ASSEMBLY INSTRUCTIONS

ASSEMBLY

Mount the components in the following order:—

VALVEHOLDERS. Taking care that the locating keys are in the correct direction as shown on the diagrams. **Valveholders W.X.Y. & Z.** are fitted on the underside of the chassis. On one fixing bolt of "W", fit **3 Way Tag Strip "F".** On one fixing bolt of "X" fit **Solder Tag S6.** On one fixing bolt of "Y" fit **Solder Tag S5.** On one fixing bolt of "Z" is fitted **Solder Tag S1** on top of the chassis, and **2 Way Tag Strip "E"** on the underside of the chassis. Fit **Grommets** in holes "J", "R" & "T", followed by the **Output Transformer** with the solid wire leads towards the loud speaker. Fit **Heater Transformer** and **Condenser C7.,** the latter is mounted on the special bracket supplied.

Now fit the two **I.F. Transformers** with tuning cores towards back edge of chassis. Under one fixing bolt of the 2nd I.F., fit **5 Way Tag Strip G. Condenser C24** is mounted as shown in diagram No. 3, using two 2BA Nuts as spacers on each fixing bolt. Solder two pieces of wire approximately 2″ long to the fixed plate contacts on **Condenser C1/C2,** this Condenser should now be fitted to the chassis, and the two pieces of wire passed through holes "K" and "L". On one fixing bolt of C1/C2 should be fixed **3 Way Tag Strip "B"** on top of the chassis. Fit **Solder Tag S4** on the underside of the chassis. On Condenser C1/C2 fit **3 Way Tag Strip "A", Dial Lamp Holder and Drive Wheel,** the latter should be fitted on the condenser shaft with the fixing bush and screw towards the Condenser.

Fit the two **Lower Dial Clips** to the Front Plate as it will be found difficult to fit these later in the assembly. The **Front Plate** should now be fitted and is held in place by mounting the **Volume Control, Wave Change Switch** and **Drive Spindle** through both the chassis and the Front Plate and securing with the fixing nuts of these components. Assemble the **Drive Spring** and **Drive Cord** as shown in diagram.

On the Front Plate is fitted the **Loud Speaker** with **Solder Tag S3** and **2 Way Tag Strip "U"** on the two lower fixing bolts. The Loud Speaker should be mounted with its two speech coil connections towards the left of the chassis when viewed from the front. The **5 Way Tag Strip "D"** is now fitted to the Front Plate, followed by the two **Metal Rectifiers** and the two Trimmers **C4** and **C28**—these latter two components are mounted one above the other on the Front Plate. Fit **Solder Tag S2** under the fixing bolt of the top trimmer **C28.**

Fit the **Trimming Condensers** C6, C3, C5 and C30 to **Coil "M" (RED SPOT), Coil "P" (Green Spot),** and **Coil "N" (YELLOW SPOT)** as shown in diagram No. 4. **Coil "P" (GREEN SPOT),** and **Coil "N" (YELLOW SPOT)** as shown in diagram No. 4.

Finally, fit these coils and **Coil "Q" (BLUE SPOT)** to the chassis. Coil "Q" is mounted on the fixing hole nearest to the front Plate.

WIRING

All the small components are shown in their approximate positions and should be placed as near as possible to the position indicated. Use a good flux-cored solder, and on no account use liquid fluxes, as these will cause corrosion and breakdown of components.

Note that Valveholders, Tag Strips, Coils, etc., are marked with a letter in the diagrams, and on the stock list.

This will be referred to in the wiring instructions. The Tag numbering for Coils "N", "M" & "P" and also the Wave change Switch are shown in Diagram No. 4. On the diagrams the tags marked black on the tag strips are the fixing tags which will be connected to the chassis.

Heater Transformer Connections:—

Connect RED lead to the negative tag of Rectifier B and the other RED to S1.
„ BLACK „ „ „ Dial lamp holder.
„ ORANGE „ „ Z7, Y7, X7 and W7 through hole R.
„ GREEN „ „ S1.

NOTE:—If a Heater Transformer with tags is supplied connect 1 RED and 1 BLACK tag together and then to S1.

Connect the other RED tag to negative of Metal Rectifier B. The other BLACK tag is then connected to Z7, Y7, X7 and W7 through hole R. The special Resistor provided is connected between the latter BLACK tag and the Dial Lamp Holder.

Connect + tag on Rectifier B to unmarked (or –) tag on Rectifier A. Connect + tag on Rectifier A to D1. Connect D5 to U1, through hole J.

Connect Wave Change Switch Tag 6 to N5.
„ „ „ „ „ 7 „ M (RED SPOT).
„ „ „ „ „ 8 „ N3.
„ „ „ „ „ 5 „ N4.
„ „ „ „ „ 9 „ N (YELLOW SPOT).
„ „ „ „ „ 4 „ M1.
„ „ „ „ „ D to one end of C9 the other end to W5.
„ „ „ „ „ C „ „ „ „ C10 „ „ „ „ W6.
Connect lead from C2 to Tag C on Wavechange Switch.
„ „ „ C1 „ „ A „ „ „
Connect Wave Change Switch Tag
„ „ „ „ „ B to P2 & F3.
„ „ „ „ „ 10 „ P(GREEN SPOT).
„ „ „ „ „ 11 „ Q (BLUE SPOT) through hole H.
„ „ „ „ „ 12 and 2 to Q1 „ „ „
1 to P3 & Q3 „ „ „
Tag 3 on Wave Change Switch is left blank.
Connect P1 to B2 through hole H.
„ together M3, M2, S4 and N6.
„ One end of C8 to M2 the other end to N1.
„ „ „ „ C7 „ N1 „ „ „ „ S4.
„ „ „ „ C29 „ N2 „ „ „ „ S4.
„ „ „ „ C31 „ N2 „ „ „ „ N (YELLOW SPOT).
„ „ „ „ C32 „ Q3 „ „ „ „ Q (BLUE SPOT).
„ the free end of C4 to Q (Blue Spot).
„ „ „ „ „ C28 „ Q1.

Connect Q2 to Solder Tag S2.

Connect one end of C11 to G3 the other end to G5.
„ „ „ „ C12 „ G3 „ „ „ „ G4.
„ „ „ „ C13 „ Y4 „ „ „ „ Y5.
„ „ „ „ C14 „ Y6 „ „ „ „ S4.
„ „ „ „ C15 „ W4 „ „ „ „ S4.
Connect one end of C16 to W8 the other end to S4.
„ „ „ „ C17 „ X5 „ „ „ „ X1, X2 & S6.
„ „ „ „ C18 „ negative tag on Metal Rectifier B, the other end to Solder Tag S1. Y6 is a blank pin and is used only for anchoring components. Connect RED or + end of C20 to Z8 the other end to U2. Connect one end of C21 to G4 the other end to R14, Tag 3. Connect RED or + end of C23 to U1, the other end to S3.

Connect Black Tag on C24 to U2. If a condenser is supplied for this position with only two tags the missing black tag is internally connected to the case and will make contact to the chassis through the fixing clip, this connection will not then be required.

Connect YELLOW Tag of C24 to Z4.
„ RED „ „ „ „ D1 through hole J.
„ one end of C25 to Z3 the other end to U1.
„ „ „ „ C26 „ B2 „ „ „ „ B3.
„ „ „ „ C27 „ A1 „ „ „ „ the top contact of the fixed plates of C1.
Connect one end of R1 to D1 the other end to D5.
„ „ „ „ R2 „ F1 „ „ „ „ W4.
„ „ „ „ R3 „ F1 „ „ „ „ W6.
„ „ „ „ R4 „ W8 „ „ „ „ W2, W1 & F3.
„ „ „ „ R5 „ W5 „ „ „ „ W8.
„ „ „ „ R6 „ Y4 „ „ „ „ Y6.
„ „ „ „ R7 „ G4 „ „ „ „ G5.
„ „ „ „ R8 „ X1 „ „ „ „ X5 & X8.
„ „ „ „ R9 „ Y8 „ „ „ „ G4.
„ „ „ „ R10 „ Y4 „ „ „ „ Y2, Y1 & S5.
„ „ „ „ R11 „ Y8 „ „ „ „ Y1.
„ „ „ „ R12 „ U1 „ „ „ „ C24 (YELLOW).
„ „ „ „ R13 „ G2 „ „ „ „ G1 & Y3.
„ „ „ „ R15 „ Z8 „ „ „ „ S5.
„ „ „ „ R16 „ E2 „ „ „ „ E1.
„ „ „ „ R17 „ E1 „ „ „ „ Z5.
„ „ „ „ R18 „ A1 „ „ „ „ A2.

Connect W4 to X4.

1st I.F. Transformer Connections:—
RED to F1. BLACK to F2. YELLOW to W3.

2nd I.F. Transformer Connections:—
Tag 1 (OR RED) to G2. Tag 2 (OR YELLOW) to X3.
Tag 3 (OR BLACK) to G5. Tag 4 (OR GREEN) to Y5.

Connect together Z4, G2 and F1.
„ „ Y6, F2 and A2 through hole H.
„ „ E2 and Z2.

Solder an Octal Grid Clip on flying lead from 1st I.F., to go to top cap of V2.

Connect a lead with an octal grid clip to A1 of suitable length to connect to top cap of V1.

The Solder Tags (or multi-stranded leads) on the Output Transformer are connected one to Z3 and one to U1. The solid Wire leads on the output transformer should be taken through the speaker aperture and connected to the two speech coil connections on the loud speaker.

Connect the screening case of R14 and one tag of the ON/OFF switch to S6.

Connect a screened lead to R14 of sufficient length to connect to the top cap of V3. The inner of the screened lead is connected to tag 2 on R14 and the outer screening to tag 1 on R14. The screened lead should be anchored on S3, then taken through the speaker aperture and anchored again on S1. Take care that the outer screening does not make contact with the inner conductor at either end. Solder an octal grid clip on the inner lead for connection to the top cap of V3. Connect red (+) end of C19 to Y8 the other end to Z2. Connect one end of C22 to G1, the other end to E1. Take the Mains lead through hole T and connect one wire through Hole J to the unmarked (or –) tag on rectifier B and the second wire to the free tag on the ON/OFF switch on R14. X6 is left blank. The two brackets for holding the chassis in the cabinet should now be fitted, they shall be mounted inside and flush with the bottom edge of the chassis. The first bracket is secured just below the drive spindle on the front and to a corresponding hole on the back edge. The second bracket is fitted in a similar position at the further end of the chassis.

Assemble the dial and pointer as indicated in front view diagram. The pointer should lay horizontal when the tuning condenser is at maximum capacity (all plates in mesh). Bend the dial lamp bracket until the filament of the lamp is just over the front plate, this will give maximum illumination of the dial.

CALIBRATION. USING A SIGNAL GENERATOR

Inject a 465 Kc/s. signal into grid of V1 via a 0.1 mf Condenser with a 100K Ohm resistor connected between grid and chassis.

Adjust I.F. cores for maximum output as shown on the Output Meter. Transfer Generator to Aerial lead. Switch to Short Waves, Wavechange Switch fully clockwise and adjust pointer to 20 Metres, inject a signal of 20 Meters and adjust trimmers on Coils (M) (C6) and P (C3) for maximum output. Of the two points at which the signal is received on Coil M trimmer, the one screwed most out is the correct one. Check calibration at 50 metres. Switch to Medium Wave, Wavechange Switch in mid position and adjust pointer to 200 Metres, inject a signal of 200 Metres and adjust trimmer C5 on Coil N and trimmer C4 on front plate for maximum output. Tune Signal Generator to 500 metres and set pointer to correspond, adjust padding condenser C7 for maximum output.

Return to 200 metres and retrim, checking again at 500 metres. Switch to Long Wave, Wave Change Switch fully anti-clockwise and adjust pointer to 1200 metres, inject a 1200 metre signal and adjust trimmer to C30 on Coil N and C28 on the front plate for maximum output. Check calibration at 2000 metres

CALIBRATION. USING STATIONS

I.F. Transformers are pretuned and should not be touched until a signal is received, when they should be carefully adjusted for maximum output (this adjustment will be very small). Switch to medium Waves. Wave Change Switch in mid position and tune in a station towards lower end of scale, say between 190 and 230 metres, set pointer to station's wavelength and adjust trimmer C5 on Coil N and C4 on the front plate for maximum signal.

Adjust pointer to wavelength of station received locally at good strength between 425 and 550 metres and adjust Padding Condenser C7 for maximum signal. Return to first station and readjust trimmers C5 and C4 checking again at station on higher wavelength readjusting C7 if required. Repeat several times until no further signal strength improvement takes place.

Switch to Long Waves, Wave Change Switch anti-clockwise, and set pointer to 1500 metres (B.B.C. Light) and adjust trimmer C30 on coil N and C28 on the front plate, for maximum sound output.

Switch to Short Waves, Wavechange Switch fully clockwise and set pointer to approximately 20 metres, adjust trimmers C6 on coil M and C3 on coil P until a station is heard, check wavelength by listening to station announcements. If the station being received, for example, states its wavelength to be 20 metres and the pointer is actually showing **below** this reading on the dial, adjust the tuning control until the pointer is on 20 metres and **unscrew** trimmer C6 until the station is again received. If the station is received at a setting **above** its correct reading adjust the tuning control until the pointer is at the correct reading and **screw in** trimmer C6 until the station is again received. While making these adjustments trimmer C3 should also be adjusted for maximum output.

It is advisable to try reversing the mains plug for position of minimum hum.

The cabinet back is secured in place with four P.K. self-tapping screws.

WARNING:—THE CHASSIS IS "ALIVE" AND MUST NOT BE CONNECTED TO EARTH.

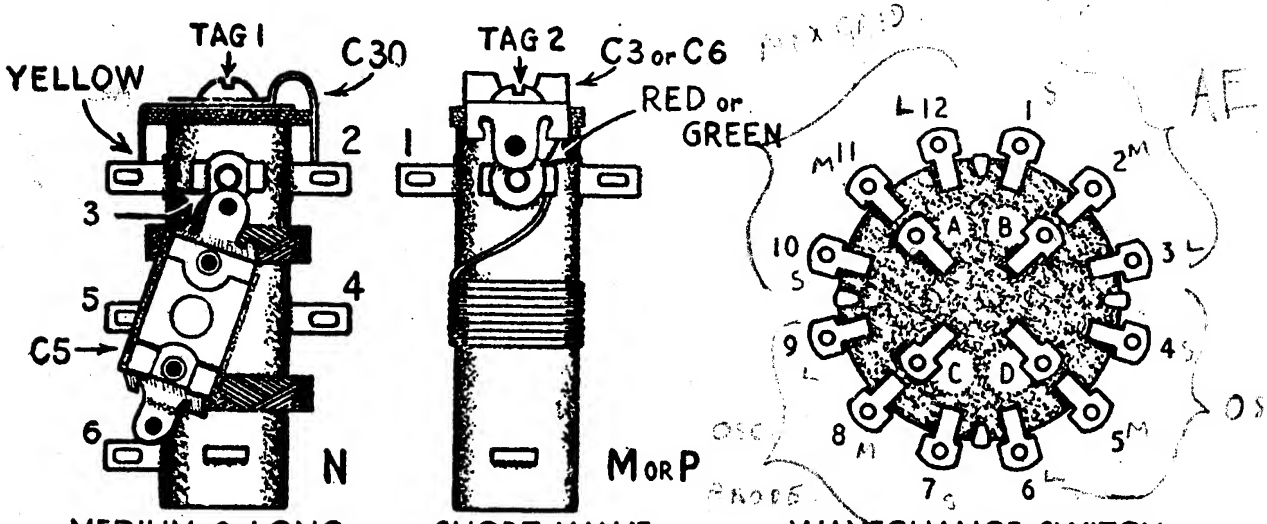


DIAGRAM No. 4

DIAGRAM No. 1

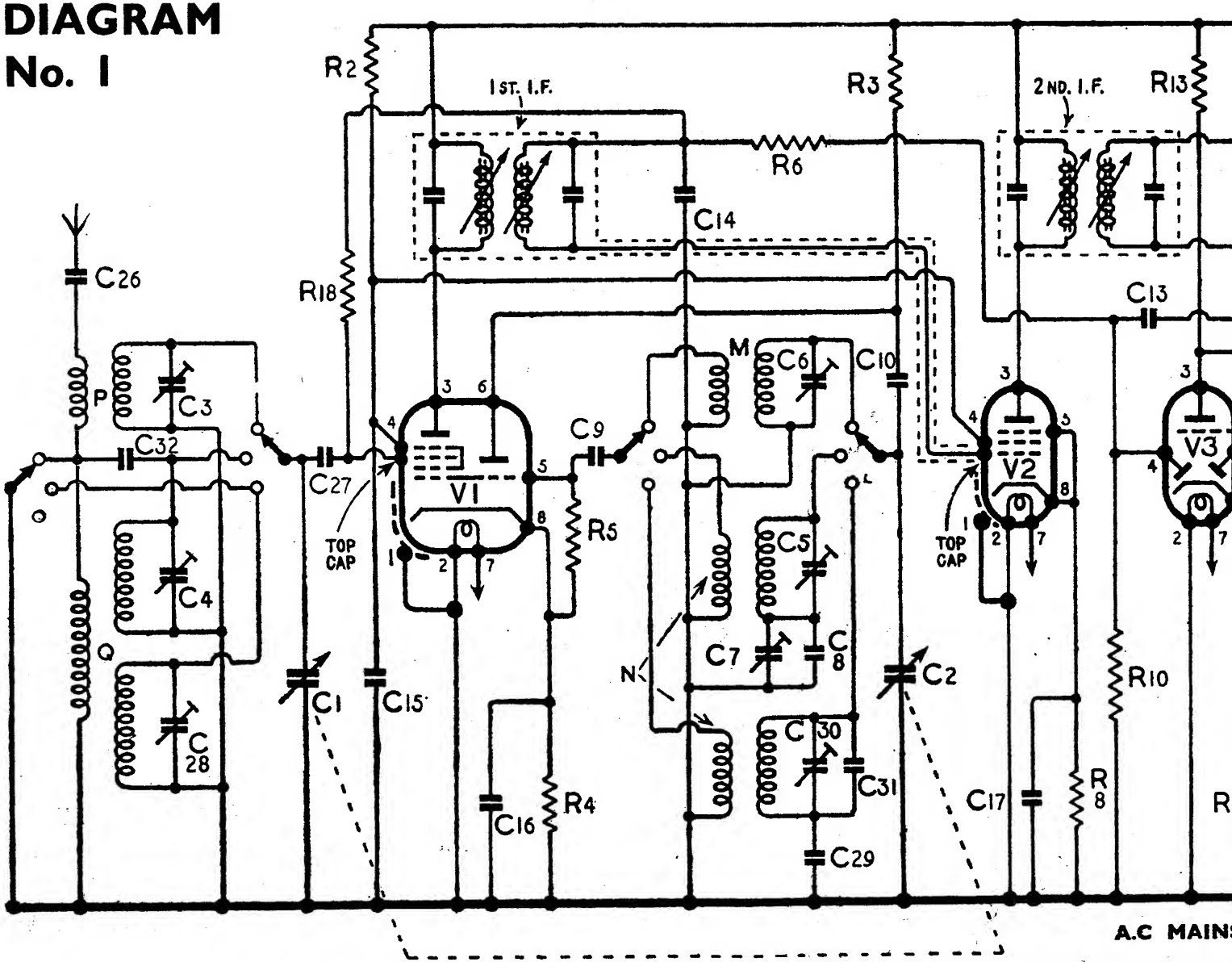

R2
1ST. I.F.
R3
2ND. I.F.
R13
R6
C14
C26
R18
C13
P
C3
C32
M
C6
C10
C9
V1
V2
V3
TOP CAP
R5
C27
C4
C5
C7
C8
C2
C1
C15
C28
C30
C31
R10
C16
R4
C17
R8
C29
A.C MAINS
"EARTHY" END OF TRIMMER C5 SHOULD BE SHOWN CONNECTED TO

DIAGRAM No. 2

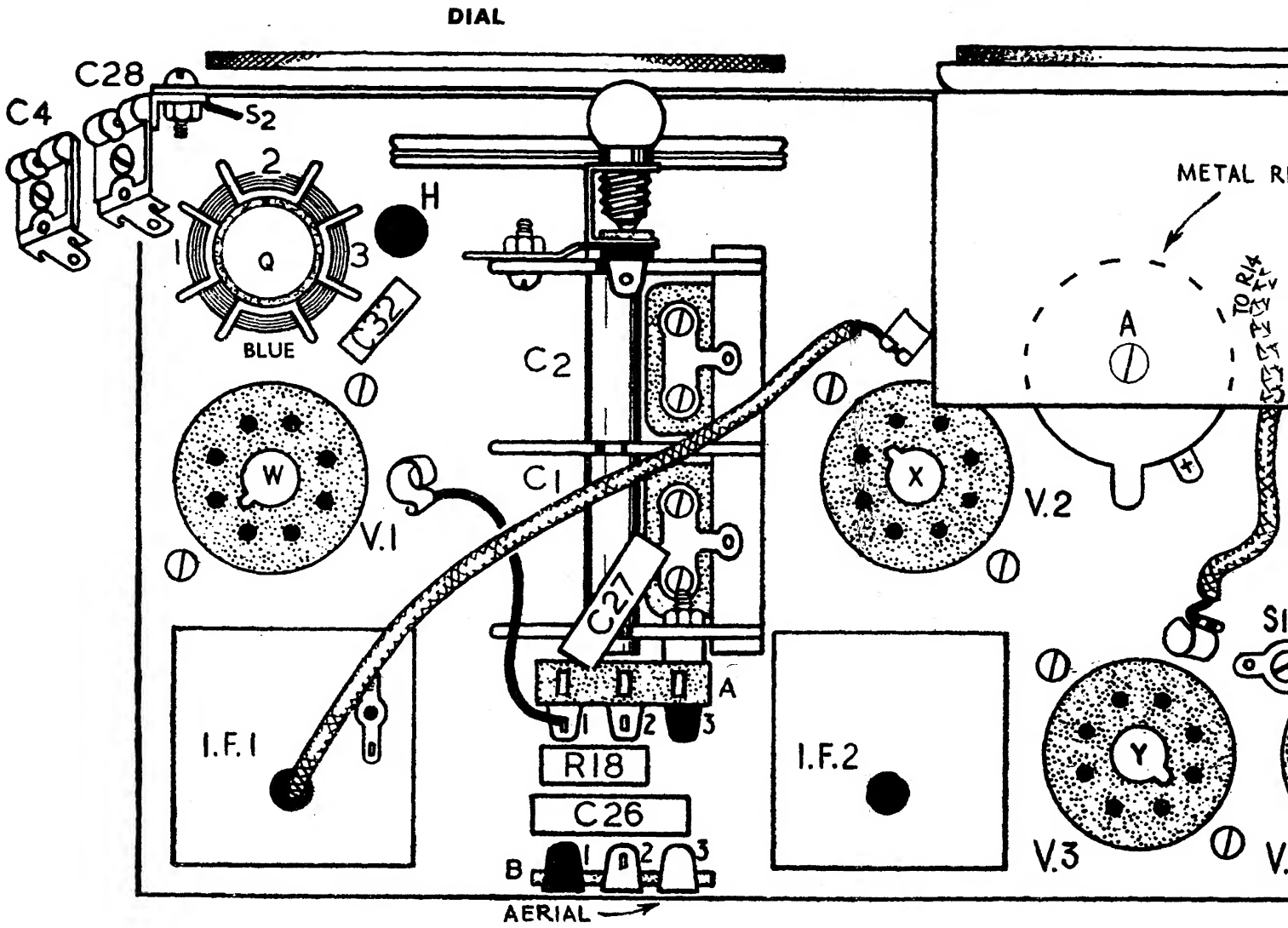
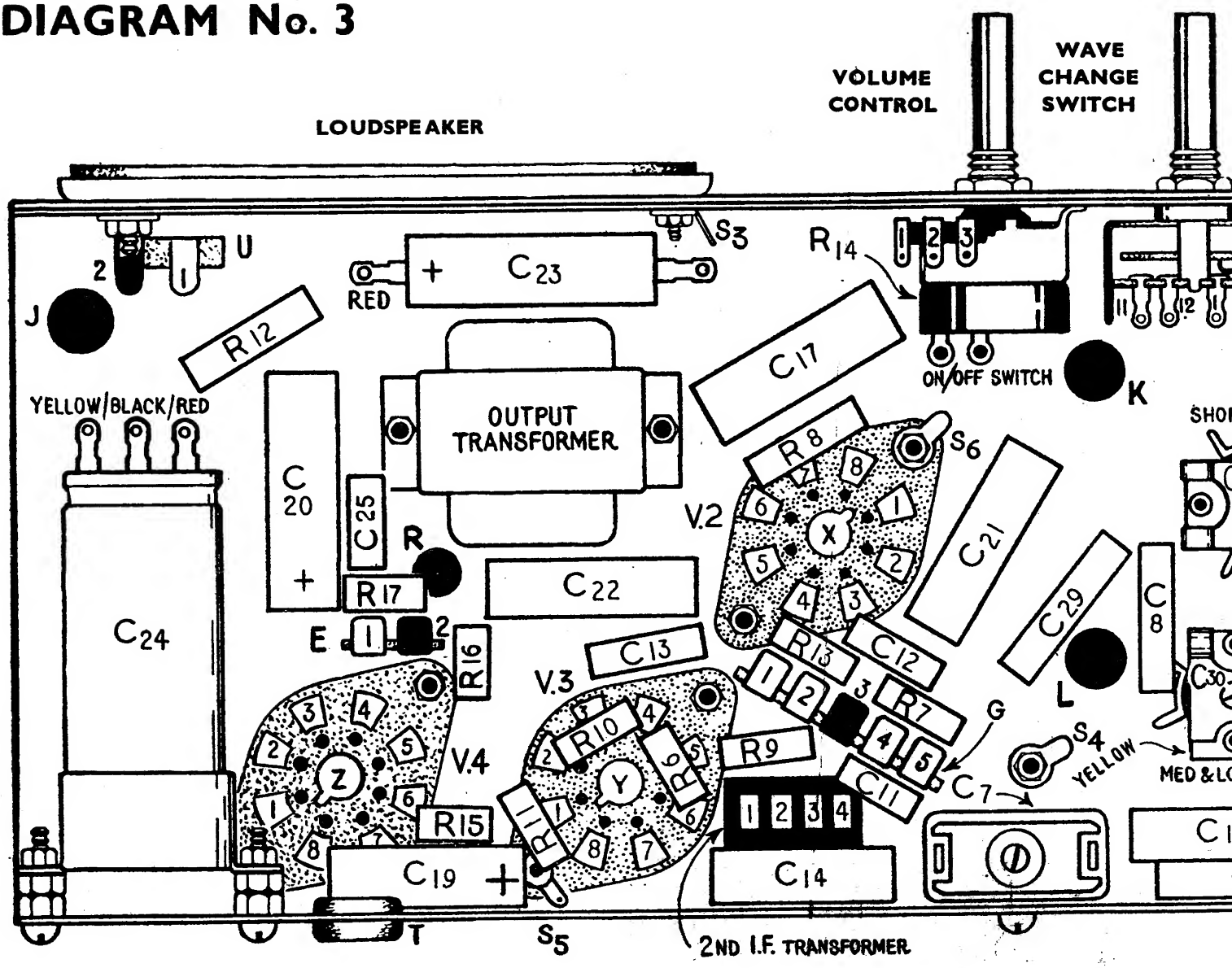
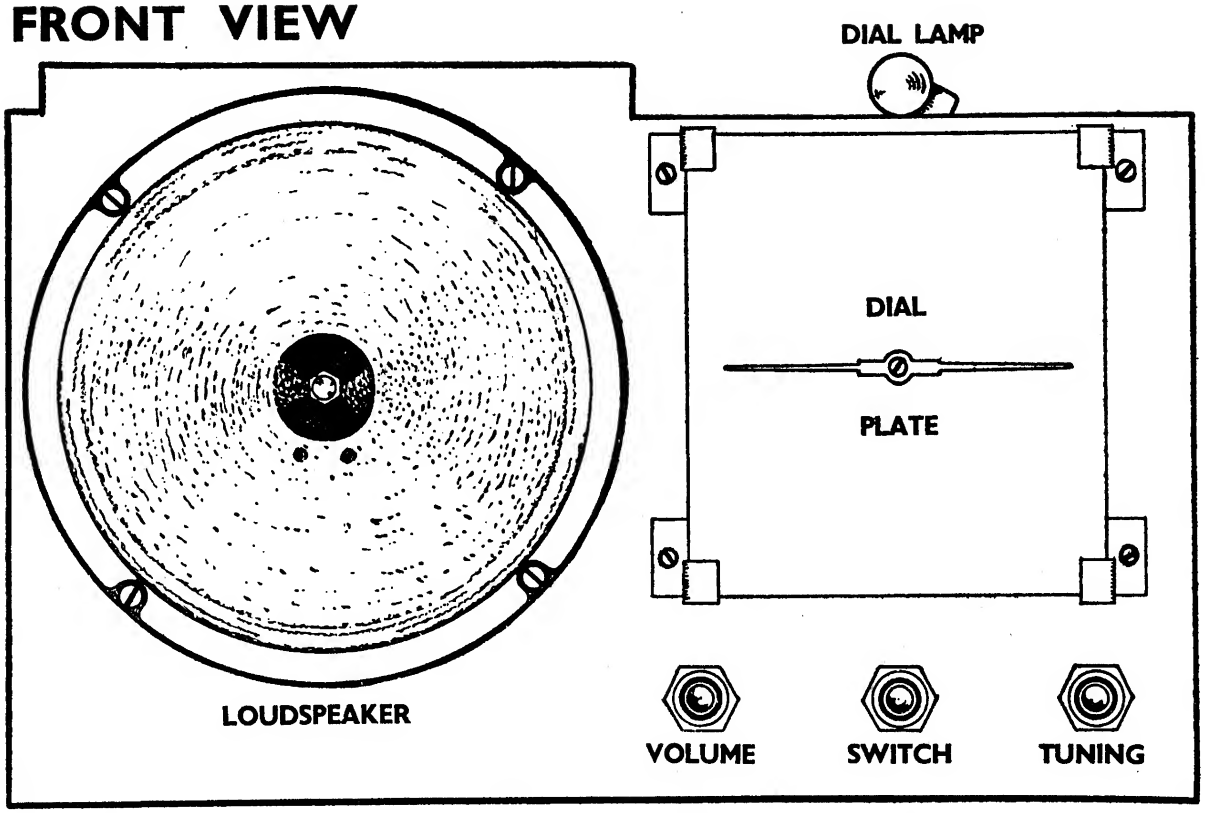

DIAL
C28
C4
S2
2
1
Q
3
H
BLUE
C32
C2
C1
W
V.1
X
V.2
METAL R
A
C27
A
1
2
3
I.F.1
R18
C26
B
1
2
3
I.F.2
Y
V.3
AERIAL

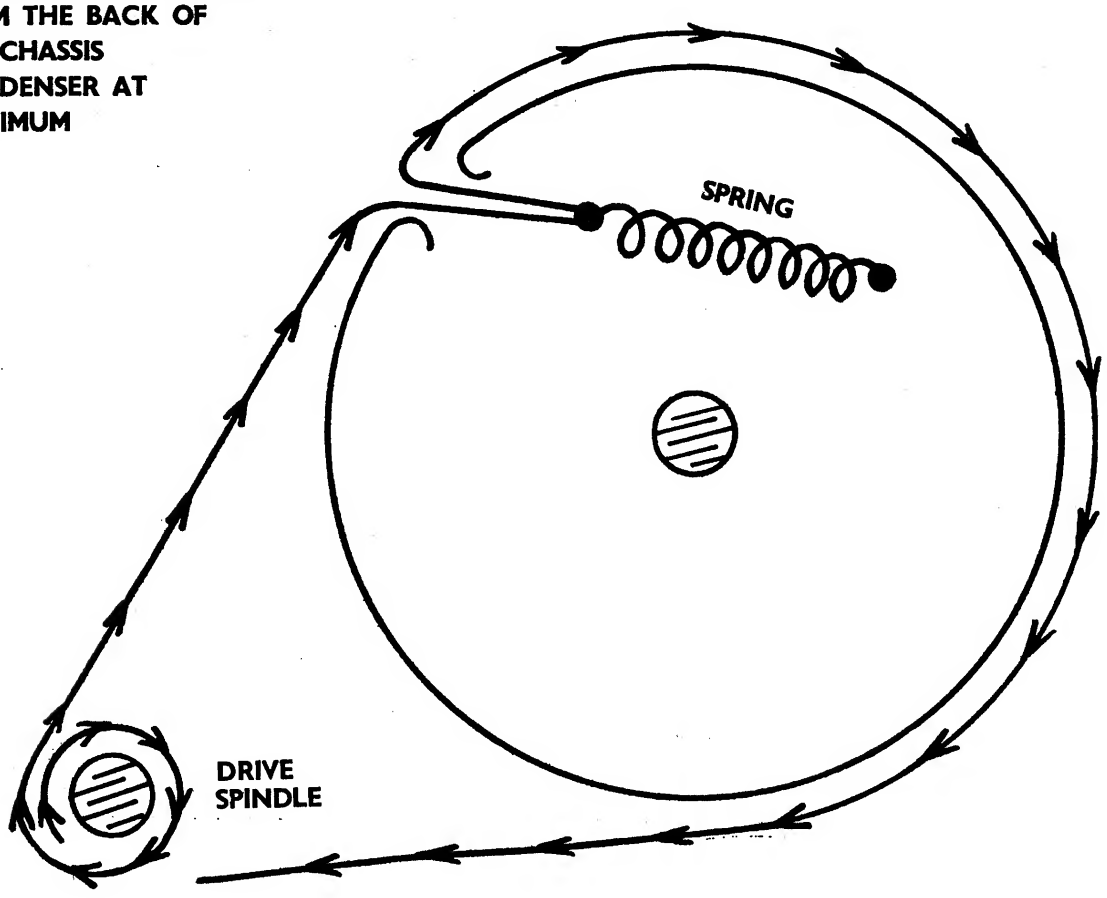
DIAGRAM No. 3


VOLUME CONTROL
WAVE CHANGE SWITCH
LOUDSPEAKER
U
J
S3
R14
C23
RED
R12
C17
ON/OFF SWITCH
K
YELLOW/BLACK/RED
OUTPUT TRANSFORMER
S6
V.2
C 20
C25
R
R17
C22
C21
C29
C 8
C24
E
R16
C13
V.3
R13
C12
R10
R9
R7
G
S4
YELLOW
MED & LO
V.4
R15
C11
C7
C19
C14
T
S5
2ND I.F. TRANSFORMER

FRONT VIEW



LOOKING AT THE DRIVE FROM THE BACK OF THE CHASSIS CONDENSER AT MAXIMUM



SUPERHET STOCK LIST

1 Cabinet with back	17/6
1 Front Plate	2/6
1 Chassis, Superhet with fixing bkts.	3/9
1 Loudspeaker, 5" (incl. P.T.)	13/6
1 Dial, 3 Band	1/6
1 Variable condenser, 2 gang, without trimmers C1/C2 ...	7/11
1 Output Transformer	5/-
1 Length drive cord, 15"	3d.
5 yds. Sleeving 2 mm. 4 yds. Connecting Wire, 22 S.W.G. tinned copper. 12" P.V.C. covered wire (Top lead to V1 and aerial lead). 12" Screened wire.	
THE LOT	2/10
1 Heater Transformer	5/11
1 Bracket, padding condenser (C7) mounting	3d.
1 Clip, Smoothing condenser (C24) fixing	5d.
1 Dial drive spindle, rear drive...	1/6
1 Wave change switch, four pole, 3 way	2/6
4 Valve holders, octal	2/-
2 Rectifiers H.T., type RM2 ...	10/-
1 Drive Drum	1/6
1 Drive Spring	3d.

2 Tag Strips, 5 way, Centre earth, "D" & "G"	1/-
3 Tag Strips, 3 way, End earth, "A," "B" & "F"	1/-
2 Tag Strips, 2 way, "E" & "U"	6d.
1 Dial lamp holder, single tag...	9d.
3 Grid clips, octal	4d.
3 Grommets, "J," "R" & "T" ...	3d.
25 Bolts, 6 BA x ¼" 4 „ 6 BA x ½" (coil fixing) 11 „ 4 BA x ½" 4 „ 4 BA x 1¼" (Rectifier Fixing & C24 Fixing). 24 Nuts 6 BA. 19 Nuts 4 BA. 4 Nuts 2 BA full (C24 spacers). 6 Solder tags 4 BA-S1 to S6. 4 Washers 6 BA (Dial fixing). 4 Screws, P.K., 5/16" (cabinet back fixing). 4 Screws P.K., ⅜" C.S. (Chassis fixing).	
THE LOT	3/6
1 Dial lamp bulb...	9d.
3 Knobs	1/6
1 Dial Pointer	4d.
2 Dial Clips, L.H.	3d.
2 Dial Clips, R.H.	3d.

RESISTORS

1-1 Meg. ohm Volume Control with switch R14	4/6
3-1 Meg. ohm ½ watt R6, R10, R16	1/-
2-470K ohm ½ watt R9, R18 ...	8d.
2-100K ohm ½ watt R13, R17 ...	8d.
3-56K ohm ½ watt R3, R5, R7 ...	1/-
1-22K ohms 1 watt R2	6d.
1- 1K „ ½ „ R11 ...	4d.
1- 1K „ 1 „ R12 ...	6d.
1-330 „ 1 „ R15 ...	6d.
1-470 „ 1 „ R1 ...	6d.
2-270 „ ½ „ R4, R8 ...	8d.

CONDENSERS

1- 10 pfd C32	6d.
1- 22 „ C13	6d.
6- 30 „ trimmers C3, C4, C5, C6, C28, C30 ...	4/6
4-100 „ C9, C10, C12, C27 ...	2/-
1-300 „ ±2% C31	6d.
1-300 „ trimmer C7	1/9
1-300 „ C11	6d.
1-470 „ ±2% C8	6d.
1-750 „ ±5% C29 (or made up with two condensers in parallel)	6d.
2-.002 mfd C25, C26	1/-
2- .05 „ C21, C22	2/-
4- .1 „ 350 V.W., C14, C15, C16, C17	4/-
1- .1 mfd 500 V.W. C18 ...	1/3
1- 8 mfd 350 V.W. Electrolytic C23	2/-
2-25 mfd 25 V.W. Electrolytic C19, C20	3/-
1-32-32 mfd 350 V.W. Electrolytic C24	4/11

VALVES

1 6K8-V1 "W" (incl. P.T.)	11/6
1 6K7-V2 "X" (incl. P.T.)	6/6
1 6Q7-V3 "Y" (incl. P.T.)	10/6
1 6V6-V4 "Z" (incl. P.T.)	7/6
1-I.F. Transformer 1st 1-I.F. Transformer 2nd } PAIR	12/6
1-Coil Med. & Long Aerial (Blue Spot) "Q" with fixing bar ...	2/6
1-Coil Short (Green Spot) "P" with fixing bar	2/6
1-Coil Med. & Long Oscillator (Yellow Spot) "N" with fixing bar	2/6
1-Coil Short Oscillator (Red Spot) "M" with fixing bar	2/6

Due to supply difficulties, it becomes necessary from time to time to substitute alternative components, usually the Condensers and Resistors. The alternative components will in no way effect the performance of the Receiver.

The parts listed above total £9 8s. 3d. when purchased separately.
We can supply all the parts at the specially reduced price of £7 19s. 6d.
Each component listed above may be purchased separately.

METAL RECTIFIERS — IMPORTANT

Great care should be taken when making soldered connections to the Metal Rectifiers to prevent any particle of solder from lodging in between the discs. If any two adjacent discs are shorted together either with solder or by bending, the Rectifier will, when put into operation, be destroyed. It is suggested that the soldered connection to the Rectifier be made with the discs of the Rectifiers in a horizontal position, so eliminating any tendency for solder to drop between the discs.

STANDARD RESISTOR COLOUR CODE

1st Figure "Body"		Colour
0	...	Black
1	...	Brown
2	...	Red
3	...	Orange
4	...	Yellow
5	...	Green
6	...	Blue
7	...	Violet
8	...	Grey
9	...	White

2nd Figure "Tip"		Colour
0	...	Black
1	...	Brown
2	...	Red
3	...	Orange
4	...	Yellow
5	...	Green
6	...	Blue
7	...	Violet
8	...	Grey
9	...	White

No. of Ciphers "Dot"		Colour
None	...	Black
0	...	Brown
00	...	Red
000	...	Orange
0000	...	Yellow
00000	...	Green
000000	...	Blue